

Two New Combinations in the Endemic Hawaiian Genus *Cyanea* (Campanulaceae: Lobelioideae)

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ABSTRACT. Examination of types for 74 names published in *Delissea* by the late Harold St. John showed that most represent previously described species that are currently treated as members of the related genus *Cyanea*. Two of the types, however, represent morphologically distinctive species, which are referable to *Cyanea* sect. *Hirtellae*. New combinations in *Cyanea* are proposed, the two species are described in greater detail, and a key to the species of the section is provided.

Cyanea Gaudich. (Campanulaceae: Lobelioideae) is a genus of trees and shrubs endemic to the Hawaiian Islands. St. John (1987a) merged the genus with its close relative *Delissea* Gaudich. and described 74 new taxa under the latter name (St. John, 1987b, 1988). Altogether, St. John recognized 166 species and 50 nonautonymic varieties and forms within his concept of *Delissea*. In the treatment of Campanulaceae (Lammers, 1990) for the *Manual of the Flowering Plants of Hawai'i*, I argued for the retention of the traditional circumscription of these two genera, recognizing 52 species plus nine nonautonymic subspecies in *Cyanea* and just nine species plus three nonautonymic subspecies in *Delissea*. Publishing deadlines did not permit me to examine types and account for all the new names proposed by St. John in *Delissea*. However, it was suggested that most would fall within my concept of *Cyanea* and prove to be referable to previously described species, particularly *C. coriacea* (A. Gray) Hillebrand, *C. fissa* (H. Mann) Hillebrand, and *C. sylvestris* A. Heller.

In May and June 1991, I visited BISH in order to examine the relevant types and determine the best disposition for each of these names. This examination confirmed the original suggestion that most of St. John's names should be treated as synonyms of various previously described species. Two of the types, however, did represent morphologically distinctive species that were new to science and referable to *Cyanea* as circumscribed in the *Manual*. These two species are here transferred to that genus and described more fully. The remaining names will

be accounted for in detail in a forthcoming monograph of the genus (Lammers, in prep.).

Cyanea eleeleensis (H. St. John) Lammers, comb. nov. Basionym: *Delissea eleeleensis* H. St. John, *Phytologia* 63: 341. 1987. TYPE: Hawaiian Islands. Kaua'i: Wainiha Valley, on side of intermittent stream below Pali 'Ele'ele, shaded gulch in wet forest, 700 ft., 19 July 1977, *Christensen 261* (holotype, BISH; isotype, BISH). [The holotype consists of a standard herbarium sheet bearing two detached leaves plus a jar of liquid-preserved floral material.]

Shrub, 1.8 m tall; stem glabrous. Lamina oblanceolate, 38.5–40.5 cm long, 11.5 cm wide, glabrous; upper surface green; lower surface pale green; margin minutely denticulate; apex acute; base cuneate. Petiole 7.8–8.5 cm long, 4 mm diam., glabrous. Inflorescence 11–20-flowered, densely short-pubescent; peduncle deflexed, 8–9 cm long, 5–7 mm diam.; rachis 2.5–4 cm long; bracts linear or narrowly triangular, 3 mm long, 1 mm wide, the apex acute; pedicels 10–17 mm long, bibracteolate in the lower 1/3; bracteoles linear or narrowly triangular, 2 mm long. Hypanthium obovoid, deeply 10-sulcate, 10–11 mm long, 11–12 mm diam., densely short-pubescent. Calyx lobes triangular, 4–5 mm long, 3 mm wide; apex acute. Corolla bilabiate, 46–47 mm long, purple with lighter longitudinal stripes, short-pubescent; tube curved, 19 mm long, 7 mm diam., cleft dorsally for 2/3 its length; dorsal lobes linear, 32 mm long, 3 mm wide, spreading horizontally; ventral lip 19 mm long, cut to its middle into three linear lobes 3–4 mm wide (the middle one a little wider than the others) and acute at apex. Staminal column slightly exerted, glabrous; filaments 35 mm long; anther tube 9 mm long, 3 mm diam., the lower 2 anthers with tufts of white hairs at apex. Berry (immature) subglobose, 12 mm long, 14 mm diam., purple, deeply 10-sulcate, crowned by the persistent calyx lobes. Seeds unknown.

Known only from the type locality in Wainiha Valley, Kaua'i, where it was found growing in wet forest at an elevation of 213 m.

Cyanea kolekoleensis (H. St. John) Lammers, comb. nov. Basionym: *Delissea kolekoleensis* H. St. John, Phytologia 63: 344. 1987. TYPE: Hawaiian Islands. Kaua'i: Wahiawa Valley, left side of stream, 765 m, 23 Sep. 1979, S. Perlman 498 (holotype, BISH; isotypes, BISH—2 sheets). [The holotype consists of a standard herbarium sheet plus a jar of liquid-preserved floral material.]

Shrub; stem unbranched, 1.5–1.9 m tall, glabrous. Lamina narrowly elliptic, 16.5–27.5 cm long, 2.7–5.7 cm wide; upper surface green, glabrous; lower surface greenish white, glabrous or the midrib minutely and sparsely pubescent; margin minutely serrulate; apex acuminate; base cuneate. Petiole terete, 3.5–9 cm long, 2 mm diam., glabrous. Inflorescence 4–8-flowered, glabrous; peduncle deflexed, 13.5–16 cm long, 2–4 mm diam.; rachis 3–6.5 cm long; pedicels sharply recurved, 18–27 mm long, reduced in length toward apex of rachis. Hypanthium obconic or obovoid, 6–13 mm long, 6–11 mm diam., densely short-pubescent. Calyx lobes triangular or deltoid, 1.5–3 mm long, 1.5–3.5 mm wide, the apex acute. Corolla bilabiate, white shading to purple on the lobes, 50–52 mm long, densely short-pubescent; tube curved, 30–39 mm long, 5.5–9 mm diam., cleft dorsally for ½ its length; dorsal lobes linear, 13–19 mm long, 1.5–3 mm wide, acute at apex; ventral lobes linear, 10–15 mm long, 1.5–3 mm wide, acute at apex. Staminal column exserted; filaments 3.7–4.9 cm long, purple, glabrous; anther tube dark purple, 9–11 mm long, 2.5–4 mm diam., the lower 2 anthers with tufts of white hairs at apex. Berries unknown.

Endemic to the Wahiawa drainage of southern Kaua'i, in wet *Metrosideros* forest at 650–765 m elevation.

Additional specimens examined. Hawaiian Islands. Kaua'i: Koloa District, Lihu'e-Koloa Forest Reserve, NW of Wahiawa Bog, along tributary of Wahiawa Stream, NW of stream and SE of Hulua, 7 Dec. 1988, Flynn & Wood 3229 (F, PTBG); Wahiawa Mts., NE of Hulua, near Waimea-Koloa district boundary, 6 Sep. 1991, Perlman et al. 12235 (F, PTBG).

Cyanea eleeleensis and *C. kolekoleensis* are both referred here to section *Hirtellae* Rock, a group of species endemic to Kaua'i (Rock, 1919). This section is characterized by shrubby habit; relatively slender, unarmed stems; entire or minutely toothed leaves; densely pubescent flowers; hypanthium 6–13 mm long; triangular calyx lobes 1–5 mm long; and corollas 25–52 mm long. Both are distinct from the five previously known members of the group. Their long deflexed peduncles are unique to the

section, as is the deeply sulcate hypanthium of *C. eleeleensis*. They and the other members of this section may be distinguished by the following key.

Key to the species of *Cyanea* sect. *Hirtellae*

- 1a. Peduncle deflexed, 8–16 cm long, with an elongate rachis 2.5–6.5 cm long.
 - 2a. Lamina oblanceolate, 38.5–40.5 cm long, 11.5 cm wide; peduncle 8–9 cm long, 5–7 mm diam., 11–20-flowered, pubescent; hypanthium deeply 10-sulcate, 11–12 mm diam.; dorsal corolla lobes longer than the corolla tube *C. eleeleensis* (H. St. John) Lammers
 - 2b. Lamina narrowly elliptic, 16.5–27.5 cm long, 2.7–5.7 cm wide; peduncle 13.5–16 cm long, 2–4 mm diam., 4–8-flowered, glabrous; hypanthium smooth, 6–11 mm diam.; dorsal corolla lobes shorter than the corolla tube *C. kolekoleensis* (H. St. John) Lammers
- 1b. Peduncle horizontal or ascending, 0.7–6 cm long, the rachis condensed or obsolete, less than 2 cm long.
 - 3a. Lamina narrowly elliptic.
 - 4a. Lamina 28–40 cm long, the margin undulate; peduncle 43–60 mm long; berries yellow *C. undulata* C. Forbes
 - 4b. Lamina 12–28 cm long, the margin flat; peduncle 7–10 mm long; berries purple *C. recta* (Wawra) Hillebrand
 - 3b. Lamina obovate, oblanceolate, or oblong.
 - 5a. Lamina 32–80 cm long; petiole 0.5–4 cm long, stout, winged; latex yellow; berries broadly obovoid, 10–15 mm diam., red-orange *C. fissa* (H. Mann) Hillebrand
 - 5b. Lamina 10–37 cm long; petiole 2.5–8 cm long, slender, terete; latex white; berries globose or obovoid, 6–10 mm diam., yellow or orange.
 - 6a. Lamina 2–6 cm wide; calyx lobes 0.5–1 mm wide; corolla 30–40 mm long, the tube 3–4 mm diam., suberect *C. hirtella* (H. Mann) Hillebrand
 - 6b. Lamina 5–13 cm wide; calyx lobes 1–2 mm wide; corolla 40–48 mm long, the tube 4–5 mm diam., gently curved *C. sylvestris* A. Heller

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